



Federal Democratic Republic of Ethiopia

EDICT OF GOVERNMENT

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ET ISO 12543-1 (2011) (English): Glass in building -- Laminated glass and laminated safety glass -- Part 1: Definitions and description of component parts

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**ETHIOPIAN
STANDARD**

ES ISO 12543-1:2012

First edition

**Glass in building — Laminated glass and
laminated safety glass — Part 1:**

(Identical with ISO 12543-1:2011)

ICS:01.040.81; 81.040.20

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ES ISO 12543-2 :2012

Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Ceramic, terracotta building materials and glass (TC 37) and published by the Ethiopian Standards Agency (ESA).

The standard is identical with ISO 12543-1:2011 Glass in building — Laminated glass and laminated safety glass — Part 1: Definitions and description of component parts published by International organization for standardization (ISO).

For the purpose of this Ethiopian Standard, the adopted text shall be modified as follows.

- The phrase “International Standard” shall be read as “Ethiopian Standard”; and
- A full stop (.) shall substitute comma (,) as decimal marker.

Glass in building — Laminated glass and laminated safety glass —

Part 1: Definitions and description of component parts

1 Scope

This part of ISO 12543 defines terms and describes component parts for laminated glass and laminated safety glass for use in building.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE Definitions 2.3 onwards apply to both laminated glass and laminated safety glass.

2.1

laminated glass

assembly consisting of one sheet of glass with one or more sheets of glass and/or plastic glazing sheet material joined together with one or more interlayers

2.2

laminated safety glass

laminated glass where in the case of breakage the interlayer serves to retain the glass fragments, limits the size of opening, offers residual resistance and reduces the risk of cutting or piercing injuries

See ISO 12543-2.

2.3

laminated glass with fire-resistant properties

laminated glass that does not achieve its fire resistance by means of interlayers, which react to high temperatures

NOTE No glass product in itself can be classified as fire resistant. When the glass product is glazed into an appropriate frame system, the assembly can be tested and classified as fire resistant. This type of laminated glass can be used as a component in a fire-resisting glazed assembly.

2.4

fire-resistant laminated glass

laminated glass where at least one interlayer reacts to the high temperature to give the product its fire resistance

NOTE This product can also contain glass components which are themselves fire resistant. No glass product in itself can be classified as fire resistant. When the glass product is glazed into an appropriate frame system, the assembly can be tested and classified as fire resistant. This type of laminated glass can be used as a component in a fire-resisting glazed assembly.

2.5

laminated glass with acoustic properties

laminated glass where at least one interlayer increases the sound transmission loss of the product

NOTE 1 Sound transmission loss can be evaluated in accordance with ISO 22897.

NOTE 2 The interlayer can be evaluated in accordance with ISO 16940, which measures the mechanical impedance of laminated glass.

2.6

symmetrical laminated glass

laminated glass in which, from both outer surfaces, the sequence of glass panes, plastic glazing sheet material and interlayer(s) by type, thickness, finish and general characteristics are the same

2.7

asymmetrical laminated glass

laminated glass in which, from both outer surfaces, the sequence of glass panes, plastic glazing sheet material and interlayer(s) by type, thickness, finish and/or general characteristics is different

2.8

flat laminated glass

laminated glass in which the constituent glass panes and plastic glazing sheet material have not been formed or bent in the course of manufacture

2.9

curved laminated glass

laminated glass in which the constituent glass panes and plastic glazing sheet material have been deliberately shaped by forming or bending prior to laminating

2.10

interlayer

one or more layers of material acting as an adhesive and separator between plies of glass and/or plastic glazing sheet material

NOTE 1 The interlayer can also give additional performance to the finished product, for example impact resistance, resistance to fire, solar control and acoustic insulation.

NOTE 2 The interlayer itself can also encapsulate non-adhesive films and plates, wires, grids, etc.

2.11

encapsulated material

non-adhesive material that is encapsulated by an interlayer between the glass and/or plastic glazing material

NOTE The non-adhesive material can be a film, plate, wire, grid, etc.

2.12

film

thin planar product of arbitrarily-limited maximum thickness in which the thickness is very small in proportion to length and width

NOTE Film is generally supplied in roll form.

2.13

plate

smooth, flat piece of material of uniform limited thickness that may be perforated

2.14

grid

regular arrangement of wires

2.15**folio lamination process**

lamination process where the interlayer is a solid film which is placed between the plies of glass or plastic glazing sheet material and is then subjected to heat and pressure to produce the final product

NOTE The pressure can be higher or lower than the ambient pressure.

2.16**cast-in-place lamination process**

lamination process where the interlayer is obtained by pouring a liquid between the plies of glass or plastic glazing sheet material and is then chemically or ultraviolet cured to produce the final product

NOTE Lamination processes other than those defined in 2.15 and 2.16 are available, but they do not necessarily fit into either of the two methods defined in 2.15 and 2.16.

2.17**stock sizes**

sizes which are intended to be recut or processed for final use

2.18**finished sizes**

sizes which are either manufactured to size or cut from stock sizes and may be further processed

NOTE Examples of further processing can include edge worked, drilled or face decorated.

3 Description of component parts**3.1 General**

Laminated glass shall be manufactured from the combinations of glass, plastic glazing sheet material and interlayers described in 3.2 to 3.5, as specified in ISO 12543-2 or ISO 12543-3.

NOTE 1 Laminated glass can also be read as laminated safety glass.

NOTE 2 The description of component parts in this clause is not exhaustive.

Some plastic glazing materials, interlayers, films, plates, wires and grids are subject to standardization. If materials are not subject to standardization, they should be subject to the laminated glass manufacturer's specifications. These specifications are usually subject to the manufacturer's own quality procedures for factory production control or the quality assurance system.

NOTE 3 Standardization of plastics can be covered by ISO 472.

3.2 Glass composition and type

NOTE Glass compositions and types are the subject of product standards (see Annex A for EN product standards or Reference [4]).

3.2.1 Glass composition

Glass compositions of laminated glass may be one of the following:

- soda lime silicate glass;
- borosilicate glass;
- alkaline earth silicate glass;

- alumino silicate glass;
- glass ceramics.

3.2.2 Glass type

The type of glass used in laminated glass may be:

- float glass;
- drawn sheet glass;
- patterned glass;
- polished wired glass;
- wired patterned glass.

3.2.3 Other characteristics of glass

The glass may also be:

- clear, tinted or coated;
- transparent, translucent or opaque;
- annealed, heat strengthened, thermally toughened (tempered) or chemically toughened;
- surface treated (e.g. by sandblast or acid etched).

3.3 Plastic glazing sheet material

Plastic glazing sheet material may be manufactured from:

- a) polycarbonate;
- b) acrylic.

The plastic glazing materials may be:

- clear, tinted or coated;
- transparent or translucent.

3.4 Interlayers

Interlayers (when they are components of the completed laminate) can differ by:

- a) material type and composition;
- b) mechanical characteristics;
- c) optical characteristics.

Interlayers may be:

- clear or tinted;

- transparent, translucent or opaque;
- coated.

3.5 Films, plates, wires and grids

Films, plates, wires and grids can differ by:

- material type and composition;
- mechanical characteristics;
- optical characteristics.

Annex A (informative)

List of EN product standards for glass compositions and types

EN 572-1, *Glass in building — Basic soda lime silicate glass products — Part 1: Definitions and general physical and mechanical properties*

EN 572-2, *Glass in building — Basic soda lime silicate glass products — Part 2: Float glass*

EN 572-3, *Glass in building — Basic soda lime silicate glass products — Part 3: Polished wired glass*

EN 572-4, *Glass in building — Basic soda lime silicate glass products — Part 4: Drawn sheet glass*

EN 572-5, *Glass in building — Basic soda lime silicate glass products — Part 5: Patterned glass*

EN 572-6, *Glass in building — Basic soda lime silicate glass products — Part 6: Wired patterned glass*

EN 1096-1, *Glass in building — Coated glass — Part 1: Definitions and classification*

EN 1748-1-1, *Glass in building — Special basic products — Borosilicate glasses — Part 1-1: Definitions and general physical and mechanical properties*

EN 1748-2-1, *Glass in building — Special basic products — Glass ceramics — Part 2-1: Definitions and general physical and mechanical properties*

EN 1863-1, *Glass in building — Heat strengthened soda lime silicate glass — Part 1: Definition and description*

EN 12150-1, *Glass in building — Thermally toughened soda lime silicate safety glass — Part 1: Definition and description*

EN 12337-1, *Glass in building — Chemically strengthened soda lime silicate glass — Part 1: Definition and description*

EN 13024-1, *Glass in building — Thermally toughened borosilicate safety glass — Part 1: Definition and description*

EN 14178-1, *Glass in building — Basic alkaline earth silicate glass products — Part 1: Float glass*

EN 14179-1, *Glass in building — Heat soaked thermally toughened soda lime silicate safety glass — Part 1: Definition and description*

EN 14321-1, *Glass in building — Thermally toughened alkaline earth silicate safety glass — Part 1: Definition and description*

Bibliography

- [1] ISO 472, *Plastics — Vocabulary*
- [2] ISO 12543-2, *Glass in building — Laminated glass and laminated safety glass — Part 2: Laminated safety glass*
- [3] ISO 12543-3, *Glass in building — Laminated glass and laminated safety glass — Part 3: Laminated glass*
- [4] ISO 16293-1, *Glass in building — Basic soda lime silicate glass products — Part 1: Definitions and general physical and mechanical properties*
- [5] ISO 16940, *Glass in building — Glazing and airborne sound insulation — Measurement of the mechanical impedance of laminated glass*
- [6] ISO 22897, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*

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Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1970.

ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check weather goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational Institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes.

Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

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